

Appl. No. 09/618,741

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claims 1 - 7 (cancelled)

Claim 8. (previously presented) The method of claim 32, wherein the mixing comprises rotating the chamber.

Claim 9. (cancelled)

Claim 10. (previously presented) The method of claim 8, further comprising: forming the aluminum oxynitride into a transparent structure.

Claim 11. (original) The method of claim 10, wherein forming the aluminum oxynitride comprises:

forming a green body comprising the aluminum oxynitride; and sintering the green body.

Claim 12. (original) The method of claim 11, further comprising: isostatically pressing the sintered green body under heat.

Claim 13. (previously presented) The method of claim 32, wherein the aluminum oxynitride comprises $\text{Al}_{23.1/3x}\text{O}_{27+x}\text{N}_{5-x}$, where $0.429 \leq x \leq 2$.

Claims 14 - 31. (cancelled)

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Claim 32. (currently amended) A method of making aluminum oxynitride, the method comprising:

(a) providing a chamber having a predetermined temperature;

(b) introducing aluminum oxide particles and carbon particles into the provided chamber;

(c) reacting the aluminum oxide particles and carbon particles introduced into the provided chamber while mixing the aluminum oxide particles and carbon particles within the provided chamber and while passing nitrogen gas over the mixing aluminum oxide particles and carbon particles with the predetermined temperature of the chamber being maintained constant at the predetermined temperature during conversion of the aluminum oxide particles, carbon particles and nitrogen into the aluminum oxynitride; and

(d) removing the aluminum oxynitride from the chamber.

Claim 33. (previously presented) The method recited in claim 32 wherein the predetermined temperature is about 1700-1900°C.

Claim 34. (previously presented) A method of making aluminum oxynitride, the method comprising:

(a) providing a chamber having a predetermined temperature;

(b) introducing aluminum oxide particles and carbon particles into the provided chamber;

(c) reacting the aluminum oxide particles and carbon particles introduced into the provided chamber while continuously mixing the aluminum oxide particles and carbon particles within the provided chamber and while passing nitrogen gas over the mixing aluminum oxide particles and carbon particles with the predetermined temperature of the chamber being maintained constant at the predetermined temperature during conversion of the aluminum oxide particles, carbon particles and nitrogen into the aluminum oxynitride; and

(d) removing the aluminum oxynitride from the chamber.

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Claim 35. (previously presented) The method recited in claim 34 wherein the predetermined temperature is about 1700-1900°C.

Claim 36. (previously presented) A method of making aluminum oxynitride, the method comprising:

- (a) providing a chamber having a predetermined temperature;
- (b) continuously introducing aluminum oxide particles and carbon particles into the provided chamber;
- (c) reacting aluminum oxide particles and carbon particles continuously introduced into the provided chamber while continuously mixing the aluminum oxide particles and carbon particles within the provided chamber and while passing nitrogen gas over the mixing aluminum oxide particles and carbon particles with the temperature of the chamber being maintained constant at the provided predetermined temperature during conversion of the aluminum oxide particles, carbon particles and nitrogen into the aluminum oxynitride; and
- (d) continuously removing the aluminum oxynitride from the chamber.

Claim 37. (previously presented) The method recited in claim 36 wherein the predetermined temperature is about 1700-1900°C.

Claim 38. (previously presented) A method of making aluminum oxynitride, the method comprising:

- (a) providing a chamber;
- (b) introducing aluminum oxide particles and carbon particles into the provided chamber;
- (c) reacting the aluminum oxide particles and carbon particles introduced into the provided chamber while mixing the aluminum oxide particles and carbon particles within the provided chamber and while passing nitrogen gas over the mixing aluminum oxide particles and carbon particles with the chamber having a temperature about 1700-1900°C during conversion of the aluminum oxide particles, carbon particles and nitrogen into the aluminum oxynitride; and

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(d) removing the aluminum oxynitride from the chamber.

Claim 39. (previously presented) A method of making aluminum oxynitride, the method comprising:

- (a) providing a chamber;
- (b) introducing aluminum oxide particles and carbon particles into the provided chamber;
- (c) reacting the aluminum oxide particles and carbon particles introduced into the provided chamber while continuously mixing the aluminum oxide particles and carbon particles within the provided chamber and while passing nitrogen gas over the mixing aluminum oxide particles and carbon particles with the chamber having a temperature selected to convert the aluminum oxide particles, carbon particles and nitrogen into the aluminum oxynitride; and
- (d) removing the aluminum oxynitride from the chamber.

Claim 40. (previously presented) The method recited in claim 39 wherein the temperature of the chamber is about 1700-1900°C.

Claim 41. (previously presented) A method of making aluminum oxynitride, the method comprising:

- (a) providing a chamber;
- (b) continuously introducing aluminum oxide particles and carbon particles into the provided chamber;
- (c) reacting aluminum oxide particles and carbon particles continuously introduced into the provided chamber while continuously mixing the aluminum oxide particles and carbon particles within the provided chamber and while passing nitrogen gas over the mixing aluminum oxide particles and carbon particles with the temperature of the chamber being maintained to convert the aluminum oxide particles, carbon particles and nitrogen into the aluminum oxynitride.

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Claim 42. (previously presented) The method recited in claim 36 wherein the temperature is about 1700-1900°C.

Claim 43. (previously presented) The method recited in claim 41 including removing the aluminum oxynitride from the chamber.

Claim 44. (previously presented) The method recited in claim 41 including continuously removing the aluminum oxynitride from the chamber.

Claim 45. (previously presented) The method recited in claim 43 wherein the temperature is about 1700-1900°C.

Claim 46. (previously presented) The method recited in claim 44 wherein the temperature is about 1700-1900°C.

Claim 47. (previously presented) A method of making aluminum oxynitride, the method comprising:

- (a) providing a chamber;
- (b) continuously introducing aluminum oxide particles and carbon particles into the provided chamber;
- (c) reacting aluminum oxide particles and carbon particles continuously introduced into the provided chamber while continuously mixing the aluminum oxide particles and carbon particles within the provided chamber and while passing nitrogen gas over the mixing aluminum oxide particles and carbon particles with the temperature of the chamber being maintained to continuously convert the aluminum oxide particles, carbon particles and nitrogen into the aluminum oxynitride.

Claim 48. (previously presented) The method recited in claim 47 wherein the temperature is about 1700-1900°C.

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Claim 49. (previously presented) The method recited in claim 47 including removing the aluminum oxynitride from the chamber.

Claim 50. (previously presented) The method recited in claim 47 including continuously removing the aluminum oxynitride from the chamber.

Claim 51. (previously presented) The method recited in claim 50 wherein the temperature is about 1700-1900°C.

Claim 52. (previously presented) The method recited in claim 49 wherein the temperature is about 1700-1900°C.

Claim 53. (New) A method of making aluminum oxynitride, the method comprising:

(a) providing a chamber;
(b) continuously introducing aluminum oxide particles and carbon particles into the provided chamber;
(c) reacting aluminum oxide particles and carbon particles continuously introduced into the provided chamber while continuously mixing and heating the aluminum oxide particles and carbon particles within the provided chamber and while passing nitrogen gas over the mixing aluminum oxide particles and carbon particles with the heating of the chamber being maintained to convert the aluminum oxide particles, carbon particles and nitrogen into the aluminum oxynitride.

Claim 54. (New) A method of making aluminum oxynitride, the method comprising:

(a) providing a chamber;
(b) continuously introducing aluminum oxide particles and carbon particles into the provided chamber;

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(c) reacting aluminum oxide particles and carbon particles continuously introduced into the provided chamber while heating and continuously mixing the aluminum oxide particles and carbon particles within the provided chamber and while passing nitrogen gas over the mixing aluminum oxide particles and carbon particles with the heating of the chamber being selected to continuously convert the aluminum oxide particles, carbon particles and nitrogen into the aluminum oxynitride.

Claim 55 (New) The method recited in claim 54 wherein the mixing comprises rotating the chamber.

Claim 56. (New) The method recited in claim 54 wherein the heating is at a temperature of about 1700°C or higher.

Claim 57. (New) The method recited in claim 56 wherein the mixing comprises rotating the chamber.